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The Effects of Video Game Play On Academic Performance

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Abstract

The purpose of the present research is to determine whether playing video games impacts academic performance as determined by GPA. To accomplish this, 198 participants filled out a Gaming Habits Survey which was analyzed using a series of one-way ANOVAs. The study found that there was a significant effect of player status on GPA at the $p < .01$ level for the two conditions of player versus non-player [$F(1, 169) = 7.08, p = .009$]. Comparisons using descriptive statistics indicated that the mean GPA score for the player condition ($M = 3.2, SD = .51$) was significantly different than the non-player condition ($M = 3.4, SD = .47$). These results show that participants who indicated that they did play video games had significantly lower GPAs than participants who indicated that they did not play video games.

The Effects of Video Game Play On Academic Performance

Today's world is one that is largely composed of technology. In a relatively short span of time we have been immersed in a world of high-definition television, Facebook, YouTube, internet radio, "green" cars, outrageous thrill rides, 3-D technology, etc. But no area of technology has become as prominent as that of video gaming.

According to Anand (2007), the penetration of video games into the United States alone is huge, with at least 90% of homes having children that have played (rented or owned) video games. This is a record level that continues to increase. 55% of console players and 66% of online players are over 18. The college demographic seems to be the major group of gamers simply because they have a lack of parental supervision and they have more

flexible schedules, allowing for more play time (Anand, 2007).

As with any other innovation in society, the introduction of video games brought the question "What are the negative effects or consequences?" Smyth (2007) notes that there seems to be an increased interest in research in the area of video gaming to answer this question. And there does indeed seem to be much research on the topic in recent years. In over-viewing the research, one main concern seems to be whether the playing of video games impacts academic performance in a negative or positive way and what those consequences are.

One study done by Anand (2007) found a negative correlation between the amount of time spent playing video games and the GPA and SAT scores of students. This means that GPA and SAT scores decreased as time spent playing increased. However, Anand (2007) did recognize the limitation of using SAT scores because they represent a one-time standardized score. Using GPA is more credible because it represents a continuous measurement of school performance. He also found that males were more prone to these results than females, because males tend to play video games more. Skoric, Teo, and Neo (2009) went one step farther and studied addiction to video gaming versus simple engagement in video gaming. Although no definitive definition of addiction was given, they found that those addicted to gaming consistently performed negatively in the academic setting, while there was no negative correlation between time spent playing or engagement and academic performance. Shao-I, Jie-Zhi, and Der-Hsiang (2004) also studied addiction (once again no definitive definition was given) and noted a decrease in school performance when the student was addicted to gaming. They found that gaming

addiction physically impacts academic achievement because the student is too involved in the game to do homework or prepare academically.

There are also others that have found decreased academic performance in relation to involvement in playing video games. Anderson and Dill (2007) studied video games and aggression and suggested that not only does gaming have an impact on performance directly, but it also triggers a higher level of aggression, which is often linked to problems in school and decreased academic performance. Wack and Tantleff-Dunn (2009) also found a negative correlation, although the relationship between GPA and academic performance in their study was not significant. Jackson et al (2008) found that time spent playing games was a negative predictor of academic performance and that those who played video games more often had poorer grades than those who played less. A study conducted by Wood, Griffiths, and Parke (2007) included open-ended questions that encouraged participants to report different feelings about playing video games. Some of the negative consequences indirectly related to school performance, in that participants reported often missing lectures, skipping homework, etc. They also found that these consequences were more likely to impact males, because males play more often and were more likely to report losing track of the time while playing. In an experiment by Williams (2006), school performance increased after the participants dramatically decreased (limited time spent using technology to 30 minutes per day) their usage of all technology, including video games. Finally, Jaruratanasirikul, Wongwaitawee Wong, and Sangsupawanich (2009) found that the excessive playing of video games (five hours or more per session) resulted in school grades that were below a 3.00 average, and that time spent playing was a predictor of academic performance. They also suggested that video games indirectly lead to decreased performance through promoting

violence. Finally, they noted that playing video games took time away from school activities, homework, social interaction, etc.

Then there are those in the research field who have come up with neutral results. Smyth (2007) studied the difference between playing massively multiplayer online role-playing games (MMORPG) and playing other types of video games and found that even though the MMORPG group reported greater interference in academic work (such as skipping homework, missing a class, etc) as opposed to the other groups, overall the groups did not differ in academic performance. Hart et al (2009) used the Problem Video Game Playing survey to measure four different areas of life, including academic behavior, impacted by the playing of video games and suggested that there was not a significant correlation in any area.

However, there is also plenty of research to suggest that interactive video games can actually lead to increased academic performance (Anand, 2007). Jackson et al (2008) found that the usage of games is causally related to an increase in visual-spatial skills, which often come in handy in the fields of science, mathematics, technology, and engineering. A study done with Kindergarteners (Din & Calao, 2001) showed that students who played educational video games on the Sony Lightspan, which is a game system similar to the Sony Playstation One, made significant increases over the control group in the learning of spelling and reading; however, no significant gain was made over the control group in math. This suggests a facilitative role of playing video games in developing verbal skills (2001).

Smyth (2007) suggested that complex games may lead to academic success by engaging players in problem solving, critical thinking, and creativity. Skoric et al (2009) found that while game addiction leads to negative academic performance, moderate engagement in gaming can lead to improved performance in an academic setting. They found a positive correlation between game play

and English test scores, which suggests that gaming can actually lead to better test scores. North Carolina State University is even experimenting with a synchronous online graduate course that integrates video game design with science curriculum (Annetta, Murray, Laird, Bohr & Park, 2008)

To sum up this overview of the recent literature on the relationship between the usage of video games and academic performance, Anderson and Dill (2000, pg 17) quite aptly state the predicament in researching this topic: "There is no definitive answer to the question of whether video games disrupt academic performance." As the literature review shows, much has been said to support every aspect of the topic, both positive and negative. The present study seeks to answer the question: Does playing video games have an impact on academic performance as measured by amount of time playing and school GPA? This proposal's hypothesis is that as time spent playing increases, GPA will decrease; also that as level of cognitive engagement as determined by number of puzzles/strategy situations encountered increases, GPA will increase.

Method

Participants

Participants were 198 college students from University of the Cumberlands. Participants were recruited for the study from five different Old Testament Survey courses required for the general education curriculum. The ages of the participants ranged from 17 to 44, with 98.5% being in the 17 to 23 category and only 3 participants falling above this age range. There were 83 males (41.9%) and 115 females (58.1%). 169 participants (85.4%) were white and 29 participants were non-white (14.6%). There were 104 freshmen (52.5%), 61 sophomores (30.8%), 23 juniors (11.6%) and 10 seniors (5.1%) included in the study.

The participants were also placed into categories according to self-reported major; the categories were natural sciences, social

sciences, humanities, and other. The natural sciences included the reported majors of Biology, Chemistry, Physics, Pre-pharmacy, and Engineering. Forty-six participants (23.2%) fell into this category. The social sciences included the reported majors of Psychology, Sociology, Public Health, Human Services, Criminal Justice, Political Science, and Pre-law. 43 participants (21.7%) fell into this category. The humanities included the reported majors of Art, English, History, Foreign Languages, Religion, Communication Arts, Journalism, Education, Theatre, and Music. There were 55 participants (27.8%) in this category. Finally, the other category included the reported majors of Business Administration, Accounting, Math, Sports Management, Physical Education, Exercise and Sports Science, and all participants who indicated that they were undecided concerning major. There were 54 participants (27.3%) in this category.

Materials

One form for the study was an informed consent form (see Appendix A) on which the participants were given general information about the study and provided their consent concerning the use of GPAs and all other demographic and gaming information in the present study. Participants were also told on the informed consent form that a \$25 gift card to Wal-Mart would be given as an incentive through the use of a random drawing held after data collection had been completed.

Another form used in the present study was a Gaming Habits Survey (see Appendix B) developed by the researcher for use in this particular study. The survey consisted of 11 items; the first five were concerned with demographic information such as age, gender, race, academic classification, and academic major. The last six items asked participants to report on GPA, player status (player vs. non-player), primary mode of gaming (console, handheld, or PC), amount of time spent playing games in an average week, how many puzzle or strategy situations players faced in an average

game, and what game genre had been the primary center of play for that semester. The Gaming Habits Survey was not tested for either reliability or validity. It was developed simply for the purposes of the particular research being presented.

Procedure

Shortly after mid-term grades had been posted on the University's website, the researcher gained permission from the four different Old Testament Survey professors to use their students as study participants. The researcher employed the professors as assistants by giving the research materials to the professors and letting them choose a convenient class period in which to distribute the surveys. Students filled out the informed consent forms and the Gaming Habits Survey and these materials were returned to the researcher for analysis. To choose a random participant to receive the gift card mentioned above, the researcher employed a peer to randomly draw one informed consent form from the stack of forms.

Statistical Analysis

The data that was collected was analyzed to determine if there were any significant differences between the control group (those who indicated that they did not play video games) and the experimental group (those who indicated that they did play video games) in terms of GPA, which was used as an indicator to determine if playing video games has an impact on academic performance. The data were analyzed using SPSS version 19.

The data were analyzed using a series of descriptive statistics analyses, correlation analyses, and one-way ANOVAs. The independent variable being studied was the playing of video games in the experimental group and the non-playing of video games in the control group, as operationally defined by the indication on the survey of player status and by the amount of time spent in the playing of video games. The dependent variable being studied was academic performance as measured

by self-reported cumulative college GPA after mid-term grades had been posted on the University's website.

Results

A one-way between subjects ANOVA was conducted to compare the effect of player status on GPA in player and non-player conditions. There was a significant effect of player status on GPA at the $p < .01$ level for the two conditions [$F(1, 169) = 7.08, p = .009$]. Comparisons using descriptive statistics indicated that the mean GPA score for the player condition ($M = 3.2, SD = .51$) was significantly different than the non-player condition ($M = 3.4, SD = .47$). These results show that participants who indicated that they did play video games had significantly lower GPAs than participants who indicated that they did not play video games.

There were no significant correlations concerning the effects of the amount of time spent playing games on GPA, the amount of puzzle or strategy situations faced in the average game on GPA, or gaming mode on GPA. Overall, the only statistically significant correlation was that of player status and GPA.

Discussion

The present study found that those individuals who indicated that they did play video games had significantly lower GPAs than students who indicated that they did not play video games. This finding is consistent with that of Anand (2007), who saw a decrease in both GPA and SAT scores in individuals who played video games. This finding also parallels those of Anderson and Dill (2007) and Wack and Tantleff-Dunn (2009), who saw decreases in academic performance in individuals who engaged in video game play.

An alternative explanation for the results of the present study could be that there are some outlying GPA scores among those who indicated that they did play video games. A few low GPA scores could really have

dragged the group as a whole to an average score significantly less than among the non-player group. For example, in the present study, there were several GPA scores that fell within the low 2.0 range, whereas most scores fell between 2.5 and 4.0. Also, the study did not account for other extracurricular activities, employment, or course load. It could be that the non-player group includes more people who are not as involved in campus activities and therefore have more time to focus on studies.

The findings from the present study are relevant in today's world. As mentioned above, video games have an ever increasing penetration level across the globe, leading to more immersive and engaging entertainment than ever before. The effects of gaming on multiple aspects of life are of utmost importance and consequence. Therefore the implications of the present study's results are relevant. Knowing that game players tend to have lower GPAs than non-players, should parents ban the playing of games? Should governments and schools take measures to insure that video games cannot stand in the way of educational achievement? Or should schools and parents learn to integrate gaming in the education process by supporting games that promote critical thinking and by setting healthy limits on time spent in engagement with video games? Even though time spent playing video games had no significant effect on academic performance, the results of this study indicate a true need for the setting of limits on amount of time spent playing and the need for the education system to integrate games into the learning process so that video games become a catalyst for learning instead of an automatic lowering of academic GPA scores.

The present study, while addressing the important issue of the effect of gaming on academic performance, has its limitations. One limitation is that the survey itself could have been revised to better indicate that if the participant indicated that they did not play

video games, the rest of the questions were to be left blank; several participants in the present study indicated that they did not play, but filled out the rest of the form. In that case, participants were placed in the non-player category and the rest of the data on their forms were disregarded.

Also, the survey questions could have been better written; for example, instead of just asking for a self-report on the amount of puzzles or strategy situations faced in an average game, an example could have been given of how many puzzle situations are in certain types of games in order to give players a more accurate understanding of the different genres of game and what they involve. This could have led to more accurate self-reports and could possibly have influenced the data results.

As a blooming industry with immense amounts of penetration in today's culture, the video game industry is one that should foster much research, both on the topic of the present study and on other topics. Further research should be conducted on gaming and academic performance, particularly as measured by GPA. One way this could be achieved is through a longitudinal study over the course of the college career of the participants. This would give a truer account of GPA and gaming habits, if surveys were given, say, once a year. This study would produce more accurate data because it would measure the gaming habits and GPA scores of students over the course of three to four years, whereas in the present study, GPA scores might simply indicate a light course load, a particularly rough semester, etc. Extraneous variables would have more of an effect on a short study as opposed to a longitudinal study. Also, further research could use surveys that have addressed the issues mentioned above that would produce more accurate data. Overall, there is much that can be learned about video games and academic performance; this study is just one example of research done on a small level.

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Appendix A Informed Consent Form

You, _____, are being asked to participate in a research project titled "The Effects of Playing Video Games on Academic Performance." This project is being conducted under the supervision of Jancee Wright and was approved by University of the Cumberland's Psychology Department in Fall 2010.

The investigator hopes to learn if there is a correlation between playing video games and academic performance from this project.

While participating in this study, you will be asked to fill out a survey about video game habits and GPA.

The nature of this study has been explained by Jancee Wright or the professor teaching this class. The anticipated benefits of your participation are the entrance of your name into a drawing for a Wal-Mart gift card in the amount of \$25. There are no known risks of your participation in this study.

The researchers will make every effort to safeguard the confidentiality of the information that you provide. Any information obtained from this study that can be identified with you will remain confidential and will not be given to anyone without your permission.

If at any time you would like additional information about this project, you can contact Jancee Wright at jwright4912@ucumberlands.edu.

You have the right to refuse to participate in this study. If you do agree to participate, you have the assurance that your GPA and other personal information will remain completely anonymous. The grades and services you receive from University of the Cumberland will not be negatively affected by your refusal to participate. Your signature below indicates that you have given your informed consent to participate in the above-described project. Your signature also indicates that:

- You have been given the opportunity to ask any and all questions about the described project and your participation and all of your questions have been answered to your satisfaction.
- You have been permitted to read this document.
- You are legally able to provide consent.
- To the best of your knowledge, you have provide true and accurate information on the video gaming survey.

Signature of Participant

Date

Signature of Witness

Date

Appendix B Gaming and GPA Survey

1. How old are you? _____
2. What is your gender? M _____ F _____
3. What is your race? _____
4. What is your academic classification? Fr _____ So _____ Jr _____ Sr _____
5. What is your academic major? _____
6. What is your GPA as of midterm? _____
7. Do you play video games? (Excluding casual games such as Facebook and online mini-games)

Yes _____ No _____

8. Which is your primary mode of gaming? (Check one)

Console (Wii, PS3, XBOX, etc) _____

Handheld (DS, PSP) _____

PC (World of Warcraft, Lord of the Rings Online, etc) _____

9. In the average week, how many hours do you spend gaming? (Check one)

1-4 _____ 15-19 _____

5-9 _____ 20 + _____

10-14 _____

10. In your average game, roughly how many puzzles or strategy situations do you encounter? (Check one)

1-29 _____ 60 + _____

30-59 _____

11. Since the beginning of the semester, what game genre has been your primary center of play? (Action-adventure, shooter, puzzle, etc)
